Remarks

Claims 1 - 2, 4 - 9, 12 –15, 17 - 20, and 22 - 24 remain in the application.

The examiner has imposed a restriction against newly submitted claims 20 and 23. These claims have been withdrawn but must be allowed if their parent claims are allowed.

The examiner has objected to the amendment filed 4/16/10 under 35 U.S.C. 132(a) as containing new matter. The examiner states that the change from "conduction band edge" to "valence band edge" in the paragraph bridging pages 23-24 is not supported in the filed application. However, it is well established that "amendments may be made to patent applications for the purpose of curing defects, obvious to one skilled in the art ... ." *Quigley v. Zimmerman* 73 F.2d 499,503, 23 USPQ 310 (CCPA 1934). It is obvious to one or ordinary skill that the passage bridging pages 23-24 contained a technical error in associating a conduction band rather than a valence band with the p-electrode for injecting holes. The ordinary mechanic would recognize the error and make the correction sought by the amendment.

Submitted herewith under 37 CFR 1.132 is an expert's declaration from Dr. Mashiro ORITA, one of the inventors, and confirmed by another expert Prof. Hiromichi OHTA. Dr. Orita presents the general physics involved in the disputed passage including a textbook section, a copy of which is filed herewith. Dr. Orita concludes "that one of ordinary skill in the field understands that "conduction band" at lines 1-2, page 24 should be corrected to "valence band." Accordingly, according to the standards of *Quigley v. Zimmerman*, the new matter rejection should be removed and the specification need not be further amended.

The examiner has objected to claim 6 because of the replication of "comprising." This error has been corrected. The examiner also notes missing claim 21. That claim is now noted as not entered.

The examiner has rejected claims 16 and 18-19 under 35 U.S.C. 112, first paragraph as failing to comply with the written description requirement. Although Applicants believe that the absence of quantum wells is inherent in the filed application and its discussion of the lack of

barriers, in the interest of expediting prosecution, claim 16 has been canceled.

As for the written description rejection of claims 18 and 19, when the new matter rejection is removed, these claims are adequately supported in the description of the invention, as understood by the ordinary mechanic. Accordingly the written description rejection of claims 18 and 19 should be removed.

The examiner has rejected claims 18-19 under 35 U.S.C. 112, second paragraph for indefiniteness because the various energies are not referenced to any reference energy level. As previously argued, since only differences of such energies are being claimed no reference energy is required. Any reference energy level can be used and in the differencing the reference energy of whatever value disappears. The claim language, as a result, is not ambiguous. Nonetheless, new dependent claim 24 recites reference levels, even if their values are irrelevant.

The examiner has rejected claims 1-2, 4-9, 12-19 and 22 under 35 U.S.C. 103(a) as being obvious over Kawazu et al. (US patent 5,539,239).

Base claims 1 and 13 have been amended to require that the substrate be a glass, as supported at page 7, lines 15-22 of the filed application and as already claimed in the alternative in unamended claim 8. Kawazu, in contrast, uses a III-V semiconductor substrate (col. 2, ll. 49-50), typically GaAs (col. 2, line 62). Such substrates are typically monocrystalline. Glassy forms of III-V compounds or of GaAs are not disclosed. More specifically, Kawazu discloses epitaxial growth of his II-VI layer on the III-V or GaAs substrate (col. 3, line 47; col. 6, line 15; col. 8, ll. 38 and 52; col. 11, ll. 8 and 30; and col. 12, l. 25). Epitaxial growth implies that the substrate is at least crystalline if not monocrystalline. Indeed, essentially monocrystalline substrates have been felt in the prior art to be required for epitaxial growth of optically active compound semiconductors to avoid unacceptably high concentrations of defects. Kawazu repeatedly describes lattice matching between the layers. Such lattice matching makes no sense for glass substrates since a lattice is not readily defined for glass substrates. Epitaxial growth on a glass substrate is not apparent in the applied art. It is noted that Kawazu's quantum-well layers must be precisely grown, as is possible with epitaxial growth on monocrystalline substrates and is not disclosed for glass substrates.

Even absent the amendments, base claims 1 and 13 should be held allowable over Kawazu. These claims place a lower limit of 100nm on the inorganic light-emitting layer. In contrast, Kawazu describes at col. 1, ll. 11-12 a ZnSe active region having a thickness of 10nm. The examiner seems to state that the claimed thickness for the intrinsic layer of 100nm to 10 microns is close to the Kawazu's thickness of 10nm and is subject to routine experimentation. This argument is incorrect. The case of *Titanium Metals*, 227 USPQ 773, 779 (Fed Cir 1985), which is sometimes cited for close ranges, concerns concentrations within small fractions of each other (0.3% vs. 0.25% Mo and 0.8% vs. 0.75% Ni), not a factor of ten as in the present case.

Further, Kawazu teaches at col. 1, lines 32-33 that a 10nm CdZnSe layer produces a quantum well layer. Kawazu uses the same 10nm thickness for his intrinsic ZnSe active layer 4 so that quantum well effects should also be expected, as would be expected by ordinary mechanics. Applicants have discussed at [0057] of US 2006/092614350 how such thin active layers would not work in the inventive device. The ordinary mechanic would not routinely test thicknesses which are far beyond those taught by Kawazu and which do not produce the quantum well structure taught by Kawazu. Routine experimentation and parameter optimization are subject to an exception "if the particular ranges produce a new and unexpected results which is different in kind and not merely in degree from the results of the prior art." *In re Aller*, 105 USPQ 233, 235 (CCPA 1955). Kawazu's design is based on quantum wells. The claimed thicknesses are far beyond that recognized for quantum wells, as is evident by Kawazu's limit, and thus produce inherently different and new results not expected for quantum wells. There is no reason to expect that a non-quantum-structure implemented in II-VI compounds would effectively operate as an effective light-emitting diode.

Claim 18 also has the 100nm lower limit on the thickness and should similarly be allowable over Kawazu. Further, the claimed limitations of the relationships between work functions and conduction and valence band edges are not disclosed in Kawazu. In view of the quantum-well nature of Kawazu's 10nm thick active layer, the claim limitations of claims 18 and 24 have not be shown to be inherently met by Kawazu.

The Commissioner is authorized to charge Deposit Account 50-0636 any required fees

including extension fees and extra-claim fees.

In view of the above amendments and remarks, reconsideration and allowance of all claims are respectfully requested. If the Examiner believes that a telephone interview would be helpful, he is invited to contact the undersigned attorney at the listed telephone number, which is on California time.

Respectfully submitted,

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